UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/661,885	09/12/2003	Charles Martin Rischar	03AB085	8511

7590   06/07/2006

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EXAMINER
CHERY, MARDOCHEE

ART UNIT	PAPER NUMBER
2188	

DATE MAILED: 06/07/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

	Application No.	Applicant(s)
Office Action Summary	10/661,885	RISCHAR ET AL.
	Examiner	Art Unit	
	Mardochee Chery	2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>09 March 2006</u>.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>1-26</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-5, 7-18 and 20-26</u> is/are rejected.

7)☒ Claim(s) <u>6 and 19</u> is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

        1.☐ Certified copies of the priority documents have been received.

        2.☐ Certified copies of the priority documents have been received in Application No. _____.

        3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

Response to Amendment

1.   This Office Action is in response to Applicant's communication filed on March 9,

2006 in response to PTO Office Action mailed on November 7, 2005. The Applicant's

remarks and amendments to the claims and/or the specification were considered with

the results that follow.

2.   In response to the Office Action mailed on November 7, 2005, claims 1, 7, 13,

16, 20, and 26 have been amended. Claims 1-26 remain pending.

Response to Arguments

3.   Applicant argues on page 7 of the remarks that neither Vasko nor Rosenquist,

alone or in combination, teaches "applying a memory lock to a program depending on

whether that program is executing, much less applying the memory lock to a portion of

memory holding a safety program when the safety program is not executing and

removing the lock from the portion of memory holding a safety program when the safety

program is executing" and "memory locking for safety applications where there is a

danger of program corruption by a standard program running on the same machine that

might degrade the reliability required of safety procedures", recited in claims 1 and 16.

        In response to applicant's argument that the references fail to show certain

features of applicant's invention, it is noted that the features upon which applicant relies

(i.e., applying a memory lock to a program depending on whether that program is

executing, much less applying the memory lock to a portion of memory holding a safety

program when the safety program is not executing and removing the lock from the

portion of memory holding a safety program when the safety program is executing and

memory locking for safety applications where there is a danger of program corruption by

a standard program running on the same machine that might degrade the reliability

required of safety procedures) are not recited in the rejected claim(s). Although the

claims are interpreted in light of the specification, limitations from the specification are

not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed.

Cir. 1993).

4.   Applicant argues on page 8, paragraph 2 of the remarks that "while Rosenquist

arguably provides a register somewhere that indicates a status of the memory portions,

there is no indication that it is readable or any need for it to be readable", recited in

claims 7 and 20.

Examiner would like to point out that according to the "IEEE100 The Authoritative

Dictionary Of IEEE Standards Terms, Seventh Edition", a register is a device

capable of retaining information like addresses or status that can be read or

written. Additionally, "Online Computing Dictionary" defines a register as

"addressable memory locations that can be read or written". Therefore, there is

no need for Rosenquist to explicitly mentions that the register in his system is

readable because a register is by definition addressable memory locations that

can be read or written.

5.   Applicant argues on page 8, paragraph 4 of the remarks that "claim 26 requires both control of memory blocking based on the state of a program as executing or not, and division of tasks according to reliability requirements. Neither Rosenquist nor Vasko teach a segregation of tasks according to required reliability for loading into protected and unprotected memory".

In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., control of memory blocking based on the state of a program as executing or not, division of tasks according to reliability requirements and a segregation of tasks according to required reliability for loading into protected and unprotected memory) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

6.   Applicant's arguments, see page 8, paragraph 2 of remarks, filed March 9, 2006, with respect to claims 6 and 19 have been fully considered and are persuasive.

Claim Objections

7.   Claims 1 and 16 are objected to because of the following informalities:

a.   in claim 1, lines 5 and 7, "and" should be inserted before –independently—

and "executing" should be changed to –execute--.

b.   In claim 16, line 8, "and" should be inserted before –providing--.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

8.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9.   Claims 1-5, 7-8, 10-13, 15-18, 20-21, 23-24 and 26 are rejected under 35 U.S.C.

103(a) as being unpatentable over Vasko (2003/0208283) in view of Rosenquist

(2002/0133680) and further in view of (Applicant Admitted Prior Art, hereinafter APA).

As per claim 1, Vasko discloses a safety controller comprising: a processing unit

having a processor executing instructions, and a memory holding instructions and data,

wherein the memory is adapted to hold a standard program and safety program, the

safety program requires higher reliability execution than the standard program [Figs. 2

and 5; pars. 2, 22, 42-43, 48, 51].

However, Vasko does not specifically teach the processing unit providing a hardware lock preventing writing of at least a portion of the memory as controllable by a lock instruction; and a lock management program executable on the processing unit unlocks a portion of memory holding the safety program at times when the safety program is executing and locking the portion of memory at other times as required by the claim.

Rosenquist discloses the processing unit providing a hardware lock preventing writing of at least a portion of the memory as controllable by a lock instruction [par.16]; and a lock management program executable on the processing unit unlocks a portion of memory holding the safety program at times when the safety program is executing and locking the portion of memory at other times [pars. 8-9 and 25] to prevent writing to the memory portion (par.16).

Since the technology for implementing a safety controller with the processing unit providing a hardware lock preventing writing of at least a portion of the memory as controllable by a lock instruction was well known as evidenced by Rosenquist, an artisan would have been motivated to implement this feature in the system of Vasko to prevent writing to the memory portion. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by Applicant to modify the system of Vasko to include the processing unit providing a hardware lock preventing writing of at

least a portion of the memory as controllable by a lock instruction because this would

have prevented writing to the memory portion (par.16) as taught by Rosenquist.

However, Vasko and Rosenquist do not specifically teach independently

executing a standard program providing control for an industrial process and a safety

program providing control of safety equipment and providing human safety in an

environment of the industrial controller as required.

APA discloses independently executing a standard program providing control for

an industrial process and a safety program providing control of safety equipment and

providing human safety in an environment of the industrial controller [pars. 4-5 and 8-9]

to ensure the safety of humans working in the environment of and industrial process

(par. 5).

Since the technology for implementing a controller with independently executing

a standard program providing control for an industrial process and a safety program

providing control of safety equipment and providing human safety in an environment of

the industrial controller was well known as evidenced by APA, an artisan would have

been motivated to implement this feature in the system of Vasko and Rosenquist in

order to ensure the safety of humans working in the environment of and industrial

process. Thus, it would have been obvious to one of ordinary skill in the art, at the time

of invention by Applicant, to modify the system of Vasko and Rosenquist to include

independently executing a standard program providing control for an industrial process

and a safety program providing control of safety equipment and providing human safety

in an environment of the industrial controller since this would have helped insuring the

safety of humans working in the environment of and industrial process (par. 5) as taught

by APA.

As per claim 2, Rosenquist discloses the portion of memory also holds data

operated on by the safety program [par. 7].

As per claim 3, Vasko discloses I/O circuitry exchanging input/output values with

an external machine and wherein the data includes input/output values [Fig.6].

As per claim 4, Rosenquist discloses the lock management program executable

on the processing unit is different from the safety program [pars. 8-9 and 25].

As per claim 5, Rosenquist discloses the lock management program executable

on the processing unit is an operating system running on the processing unit and

scheduling the execution of the safety program and standard program [par. 6].

As per claim 7, Rosenquist discloses lock instruction is a setting of a register

indicating the status of different memory portions as locked and unlocked [par. 21].

As per claim 8, Rosenquist discloses the hardware lock operates so that the

locked portion of memory may be read [Fig.2, par. 7].

As per claim 10, Rosenquist discloses the lock management program executes

to keep the portion of memory holding the standard program unlocked [par. 9].

As per claim 11, Rosenquist discloses the lock management program is a portion

of the safety program unlocking the memory portion at the start of safety program and

locking the memory portion at the conclusion of the safety program [pars. 7 and 23].

As per claim 12, Vasko discloses the portion of memory holding the safety

program also holds a copy of selected data generated by the standard program [Fig.6,

par. 75].

As per claim 13, Rosenquist discloses a lock check program periodically

checking the status of the portion of memory holding the safety program when a safety

program is not executing and invoking an error is the memory portion holding the safety

program is unlocked [pars. 20 and 28].

As per claim 15, Rosenquist discloses the second processing unit provides a

hardware lock preventing writing of at least a portion of the memory adapted to hold a

copy of the safety program as controllable by a lock instruction [par.16].

As per claim 16, the rationale in the rejection of claim 1 is herein incorporated. Vasko further discloses loading a first portion of memory with a standard program and a second portion of memory with a safety program, the safety program requiring higher reliability execution than the standard program [Figs. 2 and 5; par. 63].

However, Vasko does not specifically teach executing the safety program and standard program at different times and unlocking the second portion of memory at times when the safety program is executing and locking the second portion of memory at other times as required by the claim.

Rosenquist discloses executing the safety program and standard program at different times and unlocking the second portion of memory at times when the safety program is executing and locking the second portion of memory at other times [Fig.1; pars. 7-8 and 18-19] to prevent writing to the memory portion (par.16).

Since the technology for implementing a safety controller with executing the safety program and standard program at different times and unlocking the second portion of memory at times when the safety program is executing and locking the second portion of memory at other times was well known as evidenced by Rosenquist, an artisan would have been motivated to implement this feature in the system of Vasko to prevent writing to the memory portion. Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention by Applicant to modify the system of Vasko to include executing the safety program and standard program at different times

and unlocking the second portion of memory at times when the safety program is

executing and locking the second portion of memory at other times because this would

have prevented writing to the memory portion (par.16) as taught by Rosenquist.

As per claim 17, Rosenquist discloses the second portion of memory also holds

data operated on by the safety program [par. 7].

As per claim 18, Vasko discloses the safety controller includes I/O circuitry

exchanging input/output values with an external machine and wherein the data includes

input/output values [Fig.6].

As per claim 20, Rosenquist discloses lock instruction is a setting of a register

indicating the status of different memory portions as locked and unlocked [par. 21].

As per claim 21, Rosenquist discloses the hardware lock operates so that the

locked portion of memory may be read but not written [Fig.2, par. 7].

As per claim 23, Rosenquist discloses the lock management program executes

to keep the portion of memory holding the standard program unlocked [par. 9].

As per claim 24, Rosenquist discloses periodically checking the status of the

second portion of memory when a safety control program is not executing and invoking

an error if the memory portion is unlocked [pars. 20 and 28].

As per claim 26, Vasko discloses a method of operating a safety controller system comprising the steps of: accepting program instructions from a user describing the logical combination of input sensor data to produce output control data [par.3].

However, Vasko does not specifically teach collecting the program instructions into logical tasks; identifying the task as to one of two levels of reliability, a first level being of higher reliability than the second level;

Rosenquist discloses collecting the program instructions into logical tasks [par. 25]; identifying the task as to one of two levels of reliability, a first level being of higher reliability than the second level [par. 28]; loading a task of the first level into a first portion of memory and a task of the second level into a second portion of memory [pars. 18-19]; executing the loaded tasks at different times and unlocking the first portion of memory at times when the task of the first level is executing and locking the second portion of memory at other times [pars. 8-9 and 25] to prevent writing to the memory portion (par.16).

Since the technology for implementing a safety controller with loading a task of the first level into a first portion of memory and a task of the second level into a second portion of memory was well known as evidenced by Rosenquist, an artisan would have been motivated to implement this feature in the system of Vasko to prevent writing to

the memory portion. Thus, it would have been obvious to one of ordinary skill in the art,

at the time of invention by Applicant to modify the system of Vasko to include loading a

task of the first level into a first portion of memory and a task of the second level into a

second portion of memory because this would have prevented writing to the memory

portion (par.16) as taught by Rosenquist.

10.   Claims 9 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over

Vasko (2003/0208283) in view of Rosenquist (2002/0133680) and APA as applied to

claims 1 and 16 above, and further in view of Gafken (6,026,016).

        As per claims 9 and 22, Vasko, Rosenquist and APA disclose the claimed

invention as discussed above in the previous paragraphs. However, Vasko, Rosenquist

and APA do not specifically teach the hardware lock operates so that different portions

of memory may be simultaneously locked and unlocked as required by the claim.

        Gafken discloses the hardware lock operates so that different portions of memory

may be simultaneously locked and unlocked [Fig. 3] to disable and enable write, erase,

and read operations to the blocks of memory (col.1, lines 9-10).

        Since the technology for implementing a safety controller with the hardware lock

operates so that different portions of memory may be simultaneously locked and

unlocked was well known as evidenced by Gafken, an artisan would have been

motivated to implement this feature in the system of Vasko, Rosenquist and APA since

this would have disabled and enabled write, erase and read operations to the blocks of

memory. Thus, it would have been obvious to one of ordinary skill in the art at the time

of invention by Applicant to modify the system of Vasko, Rosenquist and APA to include

the hardware lock operates so that different portions of memory may be simultaneously

locked and unlocked because this would have enabled and disabled write, erase and

read operations to the blocks of memory (col.1, lines 9-10) as taught by Gafken.

11.   Claims 14 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable

over Vasko (2003/0208283) in view of Rosenquist (2002/0133680) and APA as applied

to claims 1 and 16 above, and further in view of Danielsen (5,136,704).

As per claims 14 and 25, Vasko, Rosenquist and APA disclose the claimed

invention as discussed above in the previous paragraphs. Vasko further discloses a

second processing unit having a processor executing instructions, and a memory

adapted to hold a copy of the safety program [Figs.2; pars. 22, 42-43].

However Vasko, Rosenquist and APA do not specifically teach a synchronization

program executable by the processing units to execute the safety program on both

processing units and compare execution of the safety programs and to enter a safety

state when this execution differs as required by the claim.

Danielsen discloses a synchronization program executable by the processing units to execute the safety program on both processing units and compare execution of the safety programs and to enter a safety state when this execution differs [Fig.3; col. 5, lines 25-45] to identify a faulty condition between the processing units (col. 5, lines 36-40).

Since the technology for implementing a safety controller with a synchronization program executable by the processing units to execute the safety program on both processing units and compare execution of the safety programs and to enter a safety state when this execution differs was well known as evidenced by Danielsen, an artisan would have been motivated to implement this feature in the system Vasko, Rosenquist and APA since this would have helped identified a faulty condition between the processing units. Thus, it would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the system of Vasko, Rosenquist and APA to include a synchronization program executable by the processing units to execute the safety program on both processing units and compare execution of the safety programs and to enter a safety state when this execution differs because this would have identified a faulty condition between the processing units (col. 5, lines 36-40) as taught by Danielsen.

Allowable Subject Matter

12.   Claims 6 and 19 are objected to as being dependent upon a rejected base claim,

but would be allowable if rewritten in independent form including all of the limitations of

the base claim and any intervening claims.

Conclusion

13.   Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

14.   When responding to the office action, Applicant is advised to clearly point out the

patentable novelty that he or she thinks the claims present in view of the state of the art

disclosed by references cited or the objections made. He or she must also show how the amendments avoid such references or objections. See 37 C.F.R. 1.111(c).

15.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mardochee Chery whose telephone number is (571) 272-4246. The examiner can normally be reached on 8:30A-5:00P.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Manonama Padmanabhan can be reached on (571) 272-4210. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

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For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

May 20, 2006

Mardochee Chery
Examiner
AU: 2188

5/24/06

MANO PADMANABHAN
SUPERVISORY PATENT EXAM:·····